

July 24, 2003

Commissioner Dawn Gallagher  
Department of Environmental Protection  
17 State House Station  
Augusta, ME 04333-0017

Dear Commissioner Gallagher:

This letter comprises initial comments from the Natural Resources Council of Maine on costs for various options to reduce phosphorus and BOD/TSS from pulp mills. Because we are not privy to the specifics of each individual mill, we cannot provide specific cost estimates on each of the alternatives listed in DEP's matrix. However, we are providing general information on the costs and feasibility of the type of improvements that will allow the Androscoggin mills to meet DO standards through the thermocline and prevent algae blooms in Gulf Island Pond.

In summary, technologies exist that would allow the Androscoggin mills to meet a thermocline standard for DO in Gulf Island Pond. These technologies are affordable. In addition, the Androscoggin mills could substantially improve their performance in ways that would dramatically reduce phosphorus loads, particularly by reducing BOD inflow to their treatment plants and lowering water use. Finally, it is critically important that DEP understand the links between influent BOD, water use, and phosphorus discharge. Because of these links, in-plant improvements will be necessary to reduce phosphorus loads to the Androscoggin River in an economic manner and scenarios that involve increased BOD/TSS loads from current levels are unlikely to be successful or affordable.

**Proven and affordable technologies exist that will allow dramatic BOD and phosphorus reductions at Maine's mills. These technologies are based on in-plant improvements.**

The technologies that will allow Maine's mills to improve their discharges dramatically are affordable and are in use in the US and around the world. International Paper (IP) in particular owns many mills that use oxygen delignification, a key technology that would allow Maine's mills to reduce both BOD and phosphorus discharges. As you know, International Paper recently purchased the Champion International Corporation. All of the former Champion kraft mills use oxygen delignification, and Champion cited both its environmental and economic benefits. In a 1997 letter to the Maine legislature, Champion engineer Michael Steltankamp wrote:

"In summary, the application of oxygen under alkaline conditions for the purpose of extending the delignification process is a proven and widely practiced technology worldwide. In addition, the use of oxygen within the bleaching process is also well-

established technology. At Champion International's bleached kraft mills at Canton N.C., Courtland Al., Pensacola, Fl., and Quinnesec, Mi., we have installed pressurized oxygen delignification systems following cooking and ahead of our bleach plants, and we have also installed atmospheric oxygen systems within the bleach plant as part of the first alkaline extraction system. **Both systems not only resulted in a significant environmental benefit, it also reduced our manufacturing costs.**" (bold and underline added)<sup>1</sup>

Given that Champion was so positive about oxygen delignification and was an attractive enough investment that IP purchased it, we are again baffled by the comments of IP's mill manager that he would not consider any process technology changes to improve the mill's effluent quality. Oxygen delignification can greatly improve effluent quality as well put mills on the path to dramatically lowering their effluent volumes and "closing the loop". For example, OD systems can result in a 60% reduction in bleach plant COD, a 70% reduction in color<sup>2</sup>, and a 40% reduction in BOD<sup>3</sup>. They can also allow a mill to decrease bleach plant effluent volume by nearly half.<sup>4</sup> Finally, oxygen delignification improves wood yield. This means that less wood can be used to make the same amount of pulp when an OD system is installed. The yield improvement may vary from mill to mill but can be expected to be several percentage points and could result in savings of approximately \$5-12 per ton of pulp produced.<sup>5</sup>

**Maine's mills have a lot of room for improvement, as does the Berlin mill in New Hampshire. In particular, in plant measures are needed to reduce influent BOD and decrease water use.**

In a recent report prepared for the Department of Environmental Protection, Neil McCubbin noted that the Berlin mill has a "very high phosphorus discharge", and that both the Rumford and Jay mills could significantly reduce their BOD discharges through well-known in-plant pollution prevention measures (again, this makes IP's comment that it would not consider in-plant measures to improve their discharges seem even more unreasonable). It also notes that the Jay mill's discharge volume is extremely large,

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<sup>1</sup> Champion International Corporation. 1997. Letter from Michael Steltankamp to the Maine Legislature. May 14.

<sup>2</sup> Andy Harrision. 1994. O2 Delig Matures into Key Process Segment at Modern N.A. Fiberlines. Pulp and Paper 68:11, pp. 55-71. P.57

<sup>3</sup>Paper Task Force (Duke University, Environmental Defense Fund, Johnson & Johnson, McDonald's, The Prudential Insurance Company of America, Time Inc.). 1995. Paper Task Force recommendations for purchasing and using environmentally preferable paper. Final Report. P. 194.

<sup>4</sup> Paper Task Force (Duke University, Environmental Defense Fund, Johnson & Johnson, McDonald's, The Prudential Insurance Company of America, Time Inc.). 1995. Paper Task Force recommendations for purchasing and using environmentally preferable paper. Final Report. P. 195.

<sup>5</sup> Neil McCubbin. Yield Improvements Possible with O<sub>2</sub> Delig, Digester Modifications. 1997. Pulp & Paper 71:6, Pp 93-97

almost 10 times what is considered standard practice in Europe, and that this is not conducive to effective operation of the wastewater treatment plant for the mill<sup>6</sup>.

The McCubbin report also describes mills in Finland, some of which are comparable in size to the Androscoggin mills and all of which are operating in a similar climate, that perform far better than Maine's mills in terms of both phosphorus and BOD discharges. These mills are also profitable: Finland has one of the most competitive paper industries in the world.

Another mill that has excellent environmental performance that Mr. McCubbin mentions in his report is the P.H. Glatfelter mill in Spring Grove PA. This mill has phosphorus discharges of about 0.2 mg/l, which would meet the performance specifications called for in Paul Mitnik's model to meet DO to the thermocline in Gulf Island Pond and eliminate the occurrence of algae blooms. This mill operates with much tighter spill control than any of the Androscoggin mills and has retrofitted oxygen delignification on its softwood line and is in the process of doing so on its hardwood line. The fiber lines at the Spring Grove mill are comparable in size and age to those at the Androscoggin mills (i.e., the Spring Grove mill is a small, older mill), proving that small mills like the Androscoggin mills can retrofit with oxygen delignification in an affordable manner and remain competitive. The Council strongly recommends that DEP discuss the performance of the Glatfelter mill with Mr. McCubbin, who we understand is familiar with it.

**The discharge of phosphorus, influent BOD, and influent volume are linked. Again, this necessitates in-plant improvements at the Androscoggin mills.**

It is important to understand that the discharge of phosphorus and BOD are linked: phosphorus is added to the mills' wastewater treatment plants as nutrients for the bacteria that metabolize BOD. Therefore, to reduce phosphorus additions, reduction of the BOD load to the wastewater treatment plant is very important. In addition, in order to minimize phosphorus addition to the treatment plant, it is important to have the treatment plant operating as efficiently as possible. When influent flow is lower, wastewater treatment plants operate more efficiently. Less phosphorus addition is also required to reach sufficient concentrations in the treatment plant to optimize bacterial growth (mills with very well run treatment systems do not need to add phosphorus at all during normal operations<sup>7</sup>).

The McCubbin phosphorus report states that the Androscoggin mills could greatly improve their water management practices. As noted above, IP's water flow is 10 times what is considered standard practice in Europe. In terms of lowering influent BOD to help with the control of phosphorus, Mr. McCubbin states that, "an important part of phosphorus control is to implement in-mill measures to reduce organic load (BOD) from production. The most important ones are listed in EU BAT Reference document,

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<sup>6</sup> N. McCubbin Consultants Inc. 2003. Brief Review of Current Technology for Control of Phosphorus Discharge in Effluents from Three Kraft Pulp Mill on the Androscoggin River. Prepared for Maine DEP. P. 25.

<sup>7</sup> Ibid., P. 19

summarized in Table 9 on Page 13.”<sup>8</sup> Again, this makes clear the necessity of in plant improvements such as oxygen delignification, good spill control, closed screen rooms, and improved brownstock washing in order to solve the environmental problems on the Androscoggin River.

### **Conclusions**

In conclusion, the technologies and practices to greatly reduce environmental impacts of the Androscoggin mills on Golf Island Pond and the river as a whole are available and affordable. Improving mill discharges sufficiently to meet standards in an economic fashion will require in plant improvements, and in plant performance is intimately linked with the discharge of phosphorus.

DEP has an enormous opportunity in the Androscoggin stakeholder process to learn, once and for all, the best and most cost-efficient means for cleaning up the Androscoggin. In particular, the Council believes that DEP now has an expert consultant, Neil McCubbin, with the knowledge to resolve the technical and cost issues associated with clean up. It is absolutely critical that DEP continue to use this type of outside expertise in this process. As Mr. McCubbin states about the Androscoggin mills in his report on controlling phosphorus discharges: **“We are confident that a detailed analysis of each mill’s WWTP [wastewater treatment plant] and operations would uncover some low-cost measures for some improvement, and would also provide reliable estimates of the cost of attaining performance equal to that of the best mills in the world”<sup>9</sup>.**

**The Council expects DEP to seize this opportunity and ensure that this information is produced.**

Please feel free to contact me with any questions, and we would be happy to provide any of the materials referred to in this letter if they would be helpful to DEP staff.

Sincerely,

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<sup>8</sup> Ibid., P. 16

<sup>9</sup> Ibid., P. 24.

